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ABSTRACT

The effect of a 6-week summer prematriculation program on the cognitive performance of educationally disadvantaged minority students in their first year of medical school was studied. A second objective was to determine if participation in the program strengthened the sources of social support available to minority students within the medical school. The two components of the summer program at the University of Illinois College of Medicine are self-assessment workshops (e.g., study habits and test-taking skills) and an introduction to the first year's curriculum. Disadvantaged, minority participants and nonparticipants from the classes of 1984, 1985, and 1986 were compared on their performance on the anatomy, biochemistry, and physiology components of the basic science examination given at the end of the first quarter of medical school. Multivariate analysis of variance indicated that participants scored significantly higher than did nonparticipants. Results of a questionnaire designed to evaluate social support were inconclusive. It is noted that other factors affecting students' performance include motivational reasons for participating in the program, and whether the participants applied the study and test-taking skills they acquired during the summer. (SW)

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THE EFFECTIVENESS OF A SUMMER PREMATRICULATION PROGRAM FOR MINORITY MEDICAL STUDENTS

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Abstract

A three-year study was conducted to determine if participation in a six-week summer prematriculation program enhanced the cognitive performance of educationally disadvantaged minority students in their first year of medical school. Multivariate analysis of variance indicated that participants scored significantly higher than non-participants. Other beneficial aspects of the program are discussed.

Since 1969 there has been a concerted effort on the part of U.S. medical schools to recruit, admit, and graduate members of minority groups having little or no representation in medical practice. Academic enrichment programs for undergraduates, high school students, and even junior high school students were instituted to increase the pool of qualified minority applicants. Admissions policies and procedures were modified, and admissions committees sought more minority representation in their membership. Tutorial, academic support, and financial aid services were established. As a result of these efforts, minority enrollment in U.S. medical schools rose from 1% in 1968-69 to 8.3% in 1981-82 (Sherman, et al, 1982).

Admission to medical school is just the first hurdle for minority students. Though considered "qualified" to meet the academic standards of the institution, in most cases they are not as well equipped as majority students to meet the demands of the stressful new environment they are about to encounter.

Studies (Strayhorn, 1980) have indicated that most medical students consider medical school a "dehumanizing experience" resulting from an overwhelming amount of material to learn with no established learning priorities, sharp competition among students, faculty who do not treat students as adults, and, during the basic science years, isolation from the real world of medicine. To introduce into this stressful setting people who already sense rejection from the dominant majority group would result in large scale failure of the minority program, unless mitigating steps are taken.

One approach to facilitating the transition of minority students into medical schools has been the summer enrichment program. Today, 49 of the 125 U.S. medical schools offer such programs for students accepted to their

schools (Minority Students Opportunities in United States Medical Schools 1982-83). These programs range from two to eleven weeks in length and usually include study and test-taking skills and either a basic medical science course for credit or highlights of the first year's curriculum.

Few attempts have been made to evaluate the effectiveness of these summer prematriculation programs. In three programs where the attempt was made, student responses to questionnaires indicated that, as a result of the programs, "most of them felt more comfortable in courses and more at ease in the medical school environment" (Beck, et al, 1978), "they have expressed satisfaction at the psychological and academic boost that they derived from participation" and "very few students who attend the program have any major adjustments or academic problems in the first year of medical school" (Minority Student Opportunities in United States Medical Schools 1982-83).

The initial objective of this study was to determine if participation in a summer prematriculation program enhanced the performance of educationally disadvantaged minority students in their first year of medical school. Significant cognitive results would certainly impress the agencies funding such a program as well as incoming students weighing the advantages of participation versus six additional weeks of income production and/or freedom from the academic setting.

The second objective of this study was to determine if participation in the program strengthened the sources of social support available to minority students within the medical school. Strayhorn (1980) studied the relationships among stressors, social supports, and health outcome for black and white medical students in a predominantly white medical school environment. He found that, even though the black students perceived more stressors, they had apparently managed to find fairly adequate social sup-

ports to help filter out the effects of the perceived stressors. He suggested that it would be interesting to investigate the sources of social supports utilized by black students: do they rely more on each other and on sources outside of the medical school than do the white students? If this is indeed the case, what can be done to improve their social supports within the school? While the six-week summer program might intensify the isolation of minority students into their own separate group, it may also give them a head start in establishing contacts with faculty, counselors, and other sources of support within the school.

Methodology

The Program

The two major components of the summer program at the University of Illinois College of Medicine are self-assessment workshops and an introduction to the first year's curriculum. The workshops are designed to aid the student in the assessment of his/her study habits, attitudes, and basic skills and provide instruction and experiences for the participants in goal setting, time-management, communication, examination anxiety, and test-taking skills. The cognitive component consists of a series of lectures, laboratory exercises, and demonstrations designed to introduce most of the fall quarter themes, i.e., biochemistry, cardiovascular, gross anatomy, nerve muscle, and histology.

Design of the Study

While all entering minority students are encouraged to participate in the summer program, not all are willing or able to do so. Thus, a group of non-participants exists with which the participants can be compared. Since not all minority students are educationally disadvantaged, those students

who, by virtue of their cognitive index (a number which takes into account college G.P.A., college attended, and MCAT scores), would have been admitted without the use of minority admissions procedures, were eliminated from the study. The remaining groups of participants and non-participants did not differ significantly in cognitive index or MCAT scores.

Participants and non-participants from the classes of 1984, 1985, and 1986 were compared as to their performance on the anatomy, biochemistry, and physiology components (encompassing the above mentioned themes) of the basic science examination given at the end of the first quarter of medical school. Multivariate analyses of variance were performed for each class and for the three classes combined using scores in anatomy, biochemistry, and physiology as the dependent variables and participation in the program as the criterion.

To evaluate social support, a questionnaire was developed by Dr. Joseph Flaherty of the Department of Psychiatry. Shortly after the fall examination, 44 minority students and 28 majority students in the Class of 1986 completed the questionnaire. In the first part of the questionnaire, students were asked to evaluate (on a 1 - 5 scale) the three most important people in their lives at this time in five areas pertaining to emotional support and understanding of their medical school endeavors. The sum of these evaluations divided by fifteen is the student's mean social support score. Other parts of the questionnaire dealt with numbers of friends among classmates, studying with classmates, and faculty members they felt they could talk to about academic or personal matters. Two analyses of variance were performed. One compared the 28 participating and 16 non-participating minority students who completed the questionnaire. The other compared these 44 minority students with the 28 majority students.

Results

Table 1 shows the mean scores and standard deviations in anatomy, biochemistry, and physiology for each of the three classes and for the three classes combined. Table 2 presents the results of the multivariate analyses of variance for each of the three classes and for the three classes combined.

TABLE 1

Participants' and Non-participants' Scores in Basic Science Disciplines

	Anatomy		Biochemistry		Physiology	
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
Class of 1984						
Participants (n=20)	54.30	11.34	54.90	10.13	59.15	10.64
Non-participants (n=18)	50.94	9.76	39.22	14.55	54.00	12.35
Class of 1985						
Participants (n=16)	58.69	10.11	54.38	12.36	54.13	11.36
Non-participants (n=11)	54.45	7.98	50.82	12.39	56.82	10.37
Class of 1986						
Participants (n=23)	56.17	10.58	53.83	13.72	61.00	11.47
Non-participants (n=7)	62.00	15.56	50.14	16.41	58.57	6.27
Classes Combined						
Participants (n=59)	56.22	10.68	54.34	11.95	58.51	11.32
Non-participants (n=36)	54.17	11.19	44.89	15.03	55.75	10.73

TABLE 2

MANOVA Results

	F	df	p
Class of 1984	5.6892	3,34	0.003
Class of 1985	1.9764	3,23	0.146
Class of 1986	1.3915	3,26	0.156
Classes Combined	4.2587	3,91	0.007

An examination of the mean scores indicates that, whereas the Class of 1984 participants performed better than the non-participants in all three disciplines, the Class of 1985 participants did not do as well in physiology

and the Class of 1986 participants were poorer in anatomy. One factor contributing to this inconsistency is the widening difference in numbers of participants vis-a-vis non-participants across the three-year span. This is due to the increase in admissions of minority students with higher cognitive indices accompanied by an increased tendency for students with low cognitive indices to participate in the program.

To assure that the significant F obtained for the combined classes was not due entirely to the first year's results, a two-way MANOVA was performed to test the significance of the effects: class, participation by class, and participation. Only the latter effect, participation, was significant.

Results of the social support study were inconclusive. Participating and non-participating minority students did not differ significantly in any of the areas studied. Because of the anonimity of the questionnaires, there were no distinctions made based on cognitive index. Thus more than half (9 out of 16) of the non-participating minority students who completed the questionnaire were not necessarily educationally disadvantaged according to the criteria used in this study. As a result, any of the gains in social support realized by the participants may be nullified when compared with a group whose social support system was already stronger.

An interesting finding was that minority students, both participating and non-participating, had found significantly more faculty with whom they could discuss personal problems than had majority students.

Discussion and Suggestions for Future Research

This investigation shows that participation in a summer prematriculation program does improve minority students' cognitive performance in their first year of medical school. However, there are other factors impacting on their performance that should be examined. These include motivational factors such as why a student chose to participate or not participate in the program, how diligently the students worked to learn the materials presented, and whether they really applied the study and test-taking skills they acquired during the summer.

Although the social support study did not produce many statistically significant results, it did define some parameters for an extension of the study. The fact that participants and non-participants did not differ significantly in social support, number of classmates with whom they study, and faculty to whom they could go for help can be explained in terms of when the questionnaire was administered. The six week summer program did give the participants a head start in terms of gaining sources of support, but it is only the first stage of a continuous urban health program. By the end of the first quarter, the non-participants may very well have caught up. Data collected at the beginning of the summer program and again at the beginning of the fall quarter would help trace these gains.

Strayhorn's suggestion deserves further pursuance in light of the significant finding that minority students sought out faculty to discuss personal problems more than majority students. It may be that the medical school is the only place where they can find people sympathetic with the particular problems endemic to medical students. If success in medical school is predicated on a strong social support system, and if educationally disadvantaged minority students are dependent upon the school (i.e., faculty,

counselling service, and other students) to provide this support, then minority opportunity programs must see to it that it is provided.

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